**3GPP TSG-RAN WG1 Meeting #114 R1-23xxxxx**

**Toulouse, France, 21-25 August, 2023**

**Agenda Item: 9.17**

**Source: Moderator (Huawei)**

**Title: Summary of email discussion [Post114-38.212-NR\_XR\_enh-Core]**

**Document for: Discussion and Decision**

# Introduction

This document summarizes the discussions on the 38.212 draft CR on XR enhancements for NR, and aims to stabilize the 38.212 draft CR.

[Post114-38.212-NR\_XR\_enh-Core] Email discussion on Rel-18 draft CRs by September 7 – Editors

# First round discussions

This section summarize the first round email discussions on draft CR v00. Companies are encouraged to provide the first round views by 09/05 (Tuesday), 6:00am UTC, then we can update the draft CR accordingly for the next step discussions.

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| *Company* | *View* |
| **Qualcomm** | Comment 1: In the CR, editor seems using two strategies. In some places, UTO-UCI is indirectly introduced by replacing CG-UCI, e.g., in the following CR text

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| If UTO-UCI is present for transmission on the PUSCH without HARQ-ACK, step 2A is applied by replacing CG-UCI with UTO-UCI in all the notations and texts.  |

In other places, UTO-UCI is directly introduced, e.g., in “6.3.2.1.4A HARQ-ACK and UTO-UCI”. We are fine with both. [Chengyan]: Yes there are two styles, the reason is that for some of the clause, we cannot just simply replace CG-UCI with UTO-UCI, one example as given below:1. Clause 6.3.2.1.3A: Clause 6.3.2.1.3 cannot simply applies to UTO-UCI by replacing the CG-UCI with UTO-UCI, since the table in clause 6.3.2.1.3 is not applicable for UTO-UCI.

However, after further checking, I tried to put the simple sentence as much as possible, i.e. section 6.3.2.4.2 and 6.2.7 also use this simple way to reflect the agreements. Details can be seen in the updated draft CR.  |
| **ZTE, Sanechips** | **Comment 1:**The changes to section 6.3.2.4.1 “UCI encoded by Polar code” seems not needed, because the maximum size of UTO-UCI is 8 bits based on the agreement. And for Uplink control information on PUSCH, when the payload of one UTO-UCI is less than 12 bits, Polar coding doesn’t apply.

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| 6.3.2.2 Code block segmentation and CRC attachmentDenote the bits of the payload by , where  is the payload size. The procedure in 6.3.2.2.1 applies for  and the procedure in Clause 6.3.2.2.2 applies for . 6.3.2.2.1 UCI encoded by Polar codeCode block segmentation and CRC attachment is performed according to Clause 6.3.1.2.1. 6.3.2.2.2 UCI encoded by channel coding of small block lengthsThe procedure in Clause 6.3.1.2.2 applies. |

[Chengyan]: Good catching. Update accordingly in the latest version.

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| **Agreement**For a CG configuration with UTO-UCI indication enabled:* For the range value for the RRC parameter Nu (Nu is the size of bit-map): (3, …, 8)
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| **Samsung** | Thank you for the draft CR. Comments from Samsung are as follows.We think the approach used in Clause 6.3.2.1.5 (and in other clauses, e.g. 6.3.2.7) is cleaner and easier for the reader to follow than the duplication of a large amount of text in Clauses 6.3.2.4.1.2, 6.3.2.4.1.3, and 6.3.2.4.1.5. It would be nicer to have a uniform approach. It can just be stated that CG-UCI (and respective notation) can be replaced by UTO-UCI (and respective notation). Similarly, there is no need for new clauses 6.3.2.4.1.4a 6.3.2.4.2.4A – clauses 6.3.2.4.1.4 and 6.3.2.4.2.4 can be used based on a statement similar to that in clause 6.3.2.1.5. For Clause 6.3.2.4.2.5, it would be clearer to say “For HARQ-ACK and CG-UCI transmission, or for HARQ-ACK and UTO-UCI transmission” instead of “For HARQ-ACK and CG-UCI/UTO-UCI transmission” as the meaning of “CG-UCI/UTO-UCI” is undefined.Some additional comments as following,**Comment 1:** The following text might be misleading and we suggest the following update to make it clearer.

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| if the number of HARQ-ACK information bits to be transmitted on PUSCH is 0, 1 or 2 bits and without CG-UCI and without UTO-UCI, if HARQ-ACK is present for transmission on the PUSCH without CG-UCI and without UTO-UCI, and the number of HARQ-ACK information bits is no more than 2,  |

[Chengyan]: Please check my reply to Qualcomm above. **Comment 2:** Clarify that UTO-UCI is configured per CG configuration in the following text to avoid misleading.

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| 6.3.2.1.3A UTO-UCIFor UTO-UCI bits transmitted on a CG PUSCH when the higher layer parameter *nrof\_UTO\_UCI* is configured for the CG PUSCH configuration, the UTO-UCI bit sequence is determined as follows:- set for and , where is provided by *nrof\_UTO\_UCI*, and the UTO-UCI bit sequence is given by clause x.x of [5, TS 38.213]. |

[Chengyan]: Not necessary. For a CG configuration without this RRC parameter configured, UTO-UCI won’t be transmitted on the corresponding CG PUSCH. **Comment 3:** UTO-UCI and CG PUSCH have the same priority according to the agreement below.

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| **Agreement**With respect to PHY two-level priority, for a configured grant PUSCH configuration, the “UTO-UCI” has the same priority level as the configured grant PUSCH.Note: The term “UTO-UCI” refers to the “UCI that provides information about unused CG PUSCH transmission occasions” for convenience. |

However, in the following text in clause 6.3.2.7, the priority of CG-UCI (which is replaced by UTO-UCI) is 1 but the priority of PUSCH is 0.

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| If *uci-MuxWithDiffPrio* is configured, and HARQ-ACK bits associated with priority index 0, HARQ-ACK bits associated with priority index 1 and/or CG-UCI associated with priority index 1, and CSI part 1 if any are transmitted on a PUSCH, - if CSI part 1 is also transmitted on the PUSCH and the PUSCH is associated with priority index 1, the coded UCI bits are multiplexed onto PUSCH according to the procedures in Clause 6.2.7 by taking HARQ-ACK with priority index 1 as HARQ-ACK, and taking HARQ-ACK with priority index 0 as CSI part 2;- otherwise, the coded UCI bits are multiplexed onto PUSCH according to the procedures in Clause 6.2.7 by taking HARQ-ACK with priority index 1 if any as HARQ-ACK, taking CG-UCI associated with priority index 1 if any as CG-UCI, taking HARQ-ACK with priority index 0 as CSI part 1, and taking CSI part 1 as CSI part 2 if CSI part 1 is also transmitted on the PUSCH and the PUSCH is associated with priority index 0. |

Same issue exists in Rel-17 for CG-UCI.[Chengyan]: The last yellow highlight corresponds to the case without CG-UCI with priority index 1, in which case PUSCH can be priority index 0. |
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# Second round discussions

Please find the updated [draft CR v2](https://www.3gpp.org/ftp/tsg_ran/WG1_RL1/TSGR1_114/Inbox/drafts/9.17%28Other%29/38.212%20draft%20CRs/%5BPost114-38.212-NR_XR_enh-Core%5D/R1-23xxxxx%20Introduction%20of%20Rel-18%20XR%20enhancements%20for%20NR%20v2.docx) based on inputs from the first round. Companies are encouraged to provide the second round views by 09/06 (Wednesday), 16:00pm UTC if any.

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